

Message Text

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UNCLAS SECTION 1 OF 2 TEHRAN 0757

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SUBJ: PROJECT FOR SOLAR ENERGY RESEARCH IN IRAN

1. SUMMARY: A NEW, INDEPENDENT SOLAR ENERGY LABORATORY HAS BEEN ESTABLISHED IN TEHRAN SUPPORTED BY A SEVEN-YEAR \$44 MILLION BUDGET. THE MATERIALS AND ENERGY RESEARCH CENTER (MERC) WILL COMBINE R&D IN ELECTRONICS, MATERIALS SCIENCE, AND ECONOMICS IN THE SOLUTION OF PROBLEMS FUNDAMENTAL TO DEVELOPMENT OF PACKAGED SOLAR POWER. FOREIGN PARTICIPATION IS BEING ENCOURAGED, AND ERDA IS URGED TO CONSIDER THE POSSIBILITY OF ESTABLISHING A SISTER LABORATORY ARRANGEMENT WITH THIS VIGOROUS NEW ENERGY RESEARCH CENTER. END SUMMARY.

2. ALTHOUGH IRAN IS MUNIFICENTLY ENDOWED WITH PETROLEUM AND NATURAL GAS, THESE RESOURCES ARE LIMITED AND ARE POTENTIALLY MUCH MORE VALUABLE AS FEEDSTOCKS FOR PETROCHEMICAL INDUSTRIES THAN THEY ARE X FUELS. IRAN'S LEADERS REALIZE THAT THE COUNTRY'S PERIOD OF WEALTH FROM OIL EXPORTS MUST BE USED TO DEVELOP NEW TECHNOLOGIES SO THAT IN THE POST-OIL ECONOMY THE COUNTRY WILL

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HAVE A VIABLE EXPORT TRADE AND ALTERNATIVE SOURCES OF POWER.

3. AT THE PRESENT TIME IRANIAN PROFESSORS HAVE LITTLE INTEREST IN DEVELOPING THE TECHNOLOGIES NEEDED FOR THE FUTURE OF THE COUNTRY AND RESEARCH AT IRANIAN UNIVERSITIES IS ALMOST EXCLUSIVELY ORIENTED TOWARD EXPANDING KNOWLEDGE IN THE TRADITIONAL ACADEMIC FIELDS. IRANIAN INDUSTRY, TOO, IS BASED MAINLY ON IMPORTED TECHNOLOGIES, AND THE MANAGERS OFTEN SEE NO ADVANTAGE IN DEVELOPING INDIGENOUS R&D IN ORDER TO INCREASE THE EFFICIENCY OF THEIR OPERATION OR THE QUALITY OF THEIR OUTPUT FOR EXPANSION INTO WORLD MARKETS. UNDER THESE CONDITIONS THERE IS NEED FOR RESEARCH ORGANIZATIONS OPERATING OUTSIDE THE UNIVERSITIES, AND FORMED WITH THE SPECIFIC GOAL OF APPLYING SCIENTIFIC KNOWLEDGE TO THE SOLUTION OF INDUSTRIAL PROBLEMS OF NATIONAL IMPORTANCE.

4. A GROUP OF SCIENTISTS AT ARYA-MEHR UNIVERSITY OF TECHNOLOGY IN TEHRAN WHO ARE SENSITIVE TO THE NATIONAL INTEREST IN DEVELOPING ALTERNATIVE SOURCES OF POWER HAVE PERCEIVED THE NEED FOR AN INDEPENDENT, INDUSTRY-ORIENTED RESEARCH ORGANIZATION TO APPLY EXISTING KNOWLEDGE TO THE DEVELOPMENT OF TECHNOLOGIES NEEDED TO HARNESS SOLAR ENERGY.

5. THE MATERIALS & ENERGY RESEARCH CENTRE (MERC) WAS FOUNDED ABOUT ONE YEAR AGO BY SPECIAL IMPERIAL DECREE AND AFFILIATED TO ARYA-MEHR UNIVERSITY OF TECHNOLOGY. THE POLICY MAKING BODY OF MERC IS KNOWN AS THE COUNCIL AND CONSISTS OF THE FOLLOWING:

DR. A. ALIKHANI (CHAIRMAN) FORMER MINISTER OF ECONOMY
FORMER CHANCELLOR OF TEHRAN UNIVERSITY
NOW IN PRIVATE BUSINESS.

DR. R. AMIN MANAGING DIRECTOR OF NATIONAL
IRANIAN STEEL INDUSTRIES CO.

MR. S. ASFIA MINISTER WITHOUT PORTFOLIO AND DEPUTY
PRIME MINISTER

MR. K. KHOSROSHAHI MANAGING DIRECTOR OF ALBORZ INVESTMENT CO.

DR. A. MAJIDI MINISTER OF STATE AND HEAD, PLAN AND
BUDGET ORGANIZATION

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DR.; *. NAJMABADI MINISTER OF INDUSTRIES AND MINES

DR. F. SOTOODEH FORMER MINISTER OF P.T.T.
NOW IN PRIVATE BUSINESS.

DR. M. ZARGHAMI CHANCELLOR, ARYA-MEHR UNIVERSITY OF
TECHNOLOGY

6. THE SENIOR MEMBERS OF THE STAFF ARE AS FOLLOWS:

DR. S. VOJDANI DIRECTOR

DR. R. HASHEMIAN DEPUTY DIRECTOR AND HEAD, ELECTRONICS
LABORATORY

DR. F. SHADMAN HEAD, AIR QUALITY CONTROL LABORATORY

DR. E.A.D. WHITE HEAD, MATERIALS ENGINEERING LABORATORY

7. THE PHILOSOPHY UNDER WHICH THE CENTRE IS ORGANIZED AND
OPERATES INCLUDES THESE SALIENT CHARACTERISTICS:

(1) IT IS MISSION ORIENTED, WHICH IMPLIES ACCEPTING
RESPONSIBILITY FOR DEVELOPING TECHNOLOGY TO THE STAGE OF CONCEPT
REALIZATION AND DEMONSTRATION.

(2) IT IS INTER-DISCIPLINARY, INVOLVING COOPERATION BETWEEN
SCIENTISTS OF DIFFERENT SPECIALTIES WHO HAVE A SENSE OF COMMON
RESPONSIBILITY FOR A COMMON PROJECT.

(3) IT BUILDS A BRIDGE BETWEEN SCIENCE AND ENGINEERING,
THE SCIENTIFIC INVESTIGATION BEING MOTIVATED BY NATIONAL NEED
AND TECHNOLOGICAL DEVELOPMENTS UTILIZING THE LATEST SCIENTIFIC
DISCOVERIES AND CONCEPTS.

(4) IT BUILDS A BRIDGE BETWEEN THE ACADEMIC AND INDUSTRIAL
COMMUNITIES BY BEING ROOTED IN THE UNIVERSITY WHILE ACCEPTING
MISSION RESPONSIBILITY.

(5) IT PROVIDES AN OPPORTUNITY FOR YOUNG PROFESSIONALS TO
BECOME INVOLVED IN NATIONAL DEVELOPMENT. STUDENTS ASSOCIATED
WITH IT WILL DEVELOP CONFIDENCE WHILE SERVING AN APPRENTICESHIP
DURING WHICH THEY DEMONSTRATE THEIR ABILITY TO MAKE A MEANING-
FUL CONTRIBUTION TO A REAL PROBLEM FACING THE COUNTRY.

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8. IN ITS FIRST YEAR MERC HAS BENEFITTED FROM THE ADVICE OF DR. J.B. GOODENOUGH OF THE MIT ENERGY LABORATOR, A WORLD AUTHORITY IN THE FIELD OF MATERIALS FOR ENERGY. IT HAS ALREADY ATTRACTED TO ITS STAFF SEVERAL FOREIGN SCHOLARS INCLUDING SEVERAL BRITONS AND AN ISRAELI WITH ESTABLISHED REPUTATIONS IN THE DISCIPLINES THAT CONTRIBUTE TO ITS MISSION, AND MORE ARE BEING ACTIVELY SOUGHT. OF COURSE, MERC IS DIRECTED AND STAFFED LARGELY BY IRANIANS, BUT THE COUNCIL HAS DIRECTED THAT OUTSTANDING FOREIGN SCIENTISTS AND ENGINEERS MAY BE HIRED FOR VARYING LENGTHS OF TIME TO IMPART THE SPIRIT OF SCIENTIFIC INVESTIGATIONS SO NECESSARY TO THE SUCCESS OF ITS MISSION AND TO BRING WITH THEM PROJECTS WHICH WILL FIT INTO THE OVERALL GOALS OF THE ORGANIZATION.

9. SINCE ITS ESTABLISHMENT FOUR SOLAR ENERGY COLLECTORS OF VARYING DESIGN HAVE BEEN BUILT AND TESTED AT MERC. THREE ARE FLAT PLATE COLLECTORS WHICH CAN COLLECT BOTH DIRECT AND DIFFUSE SOLAR RADIATION AND CAN THUS SUPPLY HEAT EVEN IN CLOUDY WEATHER. SUCH COLLECTORS CAN SUPPLY HEAT AT TEMPERATURES UP TO 100 DEGREES CENTIGRADE (100 DEGREE C) AND ARE THEREFORE ADEQUATE FOR WATER AND SPACE HEATING. THEY DO NOT, HOWEVER, PRODUCE THE TEMPERATURES NECESSARY FOR AIR CONDITIONING, AND THEREFORE A FOURTH SOLAR COLLECTOR OF THE CONCENTRATING TYPE WAS DESIGNED AND BUILT TO DELIVER WATER UNCLASSIFIED

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UNDER PRESSURE OR STEAM AT 150 DEGREE C. ECONOMIC CONSIDERATIONS ALSO FIGURE PROMINENTLY IN THESE DESIGNS, THE AIM BEING TO DEVELOP PROTOTYPES WHICH CAN BE MASS PRODUCED CHEAPLY TO SERVE THE POTENTIALLY LARGE INTERNAL MARKET FOR SOLAR COLLECTORS IN IRAN.

10. SINCE IT IS GENERALLY RECOGNIZED THAT MOST OF THE BASIC PROBLEMS RELATING TO THE UTILIZATION OF SOLAR ENERGY LIE IN THE FIELD OF MATERIALS SCIENCE, MERC DEVOTES A MAJOR SHARE OF ITS RESOURCES TO ASSESSING THE PROPERTIES OF MATERIALS WHICH COULD BE USEFUL IN THE COLLECTION, STORAGE, AND DISTRIBUTION OF SOLAR ENERGY. THE MATERIALS ENGINEERING LABORATORY AT MERC IS BEING EQUIPPED TO CARRY ON ANALYSES OF THE CHEMICAL, PHYSICAL, AND METALLURGICAL COMPOSITION OF A WIDE RANGE OF MATERIALS IMPORTANT IN THE ENERGY FIELD. THE MATERIALS ENGINEERING LABORATORY HAS ALREADY ACHIEVED CONSIDERABLE SUCCESS IN THE PRODUCTION OF BIGGER AND BETTER SILICON CRYSTALS, WHICH ARE SO BASIC TO PROGRESS IN THE SEMICONDUCTOR FIELD.

11. SINCE THOUSANDS OF "NEW" MATERIALS ARE REPORTED IN THE SCIENTIFIC LITERATURE EACH YEAR, AND RECORDS OF SEVERAL MILLIONS OF INDIVIDUAL COMPOUNDS HAVE BEEN ACCUMULATED, IT IS CLEARLY IMPOSSIBLE TO DIGEST THE GREAT MASS OF INFORMATION ON THE PREPARATION AND PROPERTIES OF ALL THESE MATERIALS WITHOUT THE ASSISTANCE OF MODERN COMPUTER STORAGE AND SORTING. A COMPUTER CENTER HAS BEEN ESTABLISHED WITHIN MERC FOR THIS PURPOSE. ALSO, IN THE NEXT FEW YEARS COMPUTER-AIDED DESIGN OF STRUCTURES WILL UNDOUBTEDLY FOLLOW. AN INTERESTING OFFSHOOT OF THE WORK OF COMPUTER SCIENTISTS AT MERC HAS BEEN THE DEVELOPMENT OF COMPUTER PROGRAMMING FOR THE DISPLAY OF FARSI SCRIPT. COMPUTER TECHNIQUES ARE ALSO BEING APPLIED TO THE CENTRE'S CONTINUING STUDY OF AIR POLLUTION IN TEHRAN, WHICH, OF COURSE, IS RELATED TO THE INTENSITY OF INSOLATION. IN SUMMARY, IT CAN BE SAID THAT THE BASIC OBJECTIVES OF MERC'S SOLAR ENERGY R&D LIE IN THE FIELDS OF (1) HEATING AND COOLING OF BUILDINGS, (2) INDUSTRIAL PROCESSING OF MATERIALS FOR ENERGY, (3) ELECTRIC POWER GENERATION, AND (4) VILLAGE ELECTRIFICATION, WITH SUPPORTING WORK IN (A) AIR POLLUTION, (B) URBAN WASTE, AND (C) ECONOMIC ASSESSMENTS.

12. UNTIL THE PRESENT MERC HAS BEEN SUPPORTED BY RELATIVELY MODEST GRANTS FROM THE PLAN AND BUDGET ORGANIZATION OF THE GOVERNMENT OF IRAN, BUT A GREAT EXPANSION IS FORESEEN IN THE UNCLASSIFIED

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NEXT SEVERAL YEARS. NINE MONTHS AGO THE MINISTRY OF ENERGY APPROVED A BUDGET FOR MERC'S SOLAR ENERGY R&D TOTALLING \$44 MILLION SPREAD OVER SEVEN YEARS. OWING PRESUMABLY TO A SHORTFALL IN EXPECTED OIL REVENUES, THE \$2 MILLION ALLOCATED FOR THE CURRENT IRANIAN YEAR HAS NOT YET BEEN RECEIVED BY MERC, BUT IT IS FULLY EXPECTED THAT AMPLE FUNDS WILL BE AVAILABLE FOR EXPANSION OF STAFF AND FACILITIES AFTER THE NEXT IRANIAN YEAR BEGINS MARCH 21, 1976. WITHIN TWO YEARS MERC EXPECTS TO BE MOVED TO NEW QUARTERS BEING BUILT SPECIFICALLY FOR IT AT KARAJ, A TOWN APPROXIMATELY 50 MILES WEST OF TEHRAN. FOR THE PRESENT THE 40 SCIENTISTS OF MERC ARE HOUSED IN TEMPORARY QUARTERS ADAPTED FROM AN APARTMENT HOUSE IN A HILLY SECTION OF NORTH TEHRAN.

13. THE ESTABLISHMENT OF MERC IS, NEXT TO IRAN'S VERY AMBITIOUS ATOMIC ENERGY PROGRAM, PROBABLY THE MOST IMPORTANT DEVELOPMENT IN R&D TO TAKE PLACE IN IRAN IN RECENT YEARS. IT APPEARS TO BE WELL CONCEIVED, WELL DIRECTED, AND APPROPRIATE TO THE CIRCUMSTANCES OF THE COUNTRY. THE EMBASSY RECOMMENDS THAT ERDA ENTER INTO CONTACT WITH MERC WITH A VIEW TO CONSIDERING THE ESTABLISHMENT OF A SISTER LABORATORY RELATIONSHIP. MIKLOS

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